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REMARKS

In the final Office Action mailed on August 11, 2006, the Examiner maintained the rejection of claims 1-29 under 35 U.S.C. 103. Applicants respectfully request reconsideration of the pending claims in view of the following remarks.

I. Claims 1-6, 11-14, and 16-29

The Examiner rejected Claims 1-6, 11-14, and 16-29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,650,422 (the Singh reference) in view of U.S. Patent No. 6,192,103 (the Wormington reference).

Independent claims 1, 16, and 22 recite that the second simulated diffraction signal is generated as an output of the machine learning system. Note, claims 1, 16, and 22 do not merely recite that the second simulated diffraction signal is generated as an output, or that the machine learning system is used in generating the second simulated diffraction signal. Instead, claims 1, 16, and 22 expressly recite that the output of the machine learning system is the second simulated diffraction signal. Applicants assert that the Examiner is making a clear error by failing to establish where this claim element is disclosed in the Wormington reference.

In particular, the Examiner has asserted that the X-ray scattering disclosed in the Wormington reference corresponds to the second simulated diffraction signal recited in claims 1, 16, and 22. Additionally, the Examiner has asserted that the genetic and evolutionary algorithms disclosed in the Wormington reference correspond to the machine learning system recited in claims 1, 16, and 22.

Thus, to be logically consistent, the Examiner must establish that the X-ray scattering disclosed in the Wormington reference is generated as an output of the genetic and evolutionary algorithms. It is not sufficient to simply establish that X-ray scattering is produced as an output because claims 1, 16, and 22 explicitly recite that the second simulated diffraction signal (which the

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Examiner has asserted corresponds to the X-ray scattering) is an output of the machine learning system (which the Examiner has asserted corresponds to the genetic and evolutionary algorithms).

The Wormington reference discloses using a genetic algorithm, particularly an evolutionary algorithm, to form a new parameter vector from two parameter vectors (see e.g. col. 3, lines 48-52) and not a diffraction signal. Thus, the output of the genetic algorithm is a new parameter vector rather than the X-ray scattering.

In the final Office Action, the Examiner states that, "Applicant's argument that Wormington et al. don't generate a simulation of X-ray scattering as output at 40 ignores the fact that step 40, as depicted in Fig. 4, is not an output step." Applicants believe that the Examiner has misunderstood the Applicants' argument.

Applicants' argument with regard to the output of step 40 in FIG. 4 was to establish that the Wormington reference discloses that the output of the genetic algorithm is a new parameter vector rather than an X-ray scattering. Whether or not the output of step 40 is the ultimate output of the process depicted in FIG. 4 is not relevant to the issue at hand (i.e., determining what is the output of the genetic algorithm disclosed in the Wormington reference).

Clearly when a step of a process is performed, there is an output of that step, even if that output is not the ultimate output of the process. In particular, step 40 is to "ADJUST MODEL PARAMETERS." Thus, adjusted model parameters are the output of having performed step 40. Similarly, step 34 is to "COMPUTE SIMULATION." Thus, a computed simulation is the output of having performed step 34. Because step 34 is performed before step 40, the computed simulation exists before the adjusted model parameters.

Column 6, lines 14-16 clearly disclose that the computed simulation generated as an output of step 34 is the X-ray scattering. Column 8, lines 3-7, discloses, "the adjustment of the model parameters at step 40, to obtain the best fit, is carried out with the use of genetic algorithms." Thus, the X-ray scattering (corresponding to step 34) exists before the genetic algorithm is used to adjust the model parameters (corresponding to step 40). Thus, X-ray scattering (which the Examiner has

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asserted corresponds to the second diffraction signal) can not be the output of the genetic algorithm (which the Examiner has asserted corresponds to the machine learning system).

With respect to the Singh reference, the Examiner states that the Singh reference fails to disclose obtaining a second diffraction signal using a machine learning system, wherein the machine learning system receives as an input one or more parameters that characterize a profile of the structure to generate the second diffraction signal, recited in independent claims 1, 16 and 22.

Therefore, Applicants assert that claims 1, 16, and 22 are allowable because neither the Singh nor the Wormington reference, individually or in combination, teach or suggest using a machine learning system to generate a simulated diffraction signal as an output of the machine learning system. Additionally, Applicants assert that claims 2-6, 11-14, 17-21, and 23-29 are allowable for at least the reason that they depend on an allowable independent base claim.

II. Claims 9-10 and 15

The Examiner rejected claims 9-10, and 15 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of US Patent No. 6,665,446 (the Kato reference).

The rejection of claims 9-10 and 15 should be withdrawn for at least the reason that they depend on an allowable independent base claim.

III. Claim 7

The Examiner rejected claim 7 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of EP Patent No. 0 448 890 (the Sirat et al. reference).

The rejection of claim 7 should be withdrawn for at least the reason that it depends on an allowable independent base claim.

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IV. Claim 8

The Examiner rejected claim 8 under 35 U.S.C. 103(a) as being unpatentable over the Singh reference in view of the Wormington reference and further in view of Gahegan et al "Dataspaces as an organizational concept for the neural classification of geographic datasets", 1999.

The rejection of claim 8 should be withdrawn for at least the reason that it depends on an allowable independent base claim.

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V. Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 509982005500. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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